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ABSTRACT

This booklet is designed to aid product service companies in finding out about the meaning of the metric system for their unique circumstances and to help them phase-in metric servicing smoothly. First is a brief discussion of what the law says about metrics and what the metric system is. Then what is involved in going metric is discussed in detail in terms of three major stages: (1) a rough analysis to determine whether it is worth looking at the question in greater detail; (2) phase-in planning, in which the considerations are refined and specific plans are made; and (3) actual metric servicing of a significant number of metric products. Sources of additional information are listed. (MNS)

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GOING METRIC
Is it for you?

A Management Model for
Small Product Service Companies

June 1982

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Introduction

If you are reading this booklet, you probably already are being asked to service some products that contain metric parts. There has been an increasing use of the metric system of measurement in the United States and throughout the world. All of the major foreign trading partners of the U.S. are now using or are converting to the metric system. In addition to the increasing sale of foreign products in the U.S., there has been an increasing trend toward use of metric parts and metric performance specifications in some domestic products. The automobile industry, for example, is already well along in converting to metric with all passenger cars expected to be predominantly metric by the early 1990s. Thus, you may be experiencing an increased demand from your customers to service products that include metric parts.

So, many product service companies* are now considering whether the time has come to develop a significant metric servicing capability in addition to their customary servicing business. For some, it may be a good move; for others, there may be no real advantages at this time.

This booklet is not intended to persuade you to go one way or the other. Its purpose is to help you find out what is best for your unique circumstances and, if you decide that you do want to phase in metric servicing now, to help you make a smooth transition.

The approach described in the following pages is a general one, designed for various types and sizes of product service companies. It will help you recognize some of the things you should consider before you decide to develop a metric service capability and will point out some possible problems if you do move in that direction. Because it is general, some of the points raised may not apply to your business.

Also, some important points are discussed in considerable detail, while others are only touched on so they will not be overlooked. If you are interested in going into any of these points in greater detail, you may want to consult the sources of more information listed at the back of the booklet. We have also included some metric conversion factors from which you can make up your own shop service charts to fit your particular product service business.

What The Law Says About Metrics

Many people have the impression that a government decision has been made to adopt the metric system of weights and measures in the United States.

The fact is that the Metric Conversion Act does not require anyone in the United States to use the metric system. Nor is

* The term, "product service company," is used consistently in this booklet for convenience although the discussion applies equally well to product service personnel working on a solo basis and to service departments of retail or distributor organizations. Also, the booklet is written from the perspective of the small business company in the product servicing business, but most of the discussion applies equally well to larger product service organizations.

there an official policy to replace the customary system — often known as the "English" system — with the metric system for all uses.

The Metric Conversion Act, which was passed by the Congress on December 23, 1975, says only that:

> "... the policy of the United States shall be to coordinate and plan the increasing use of the metric system in the United States and to establish a United States Metric Board to coordinate the voluntary conversion to the metric system."

As this Act and its legislative history make clear, the national policy is not to prefer one system over the other but to provide for either to be used on the basis of the voluntary actions of those affected. This policy of choice of converting or not converting has been U. S. policy since 1866 when use of the metric system in the United States was first authorized.

The United States Metric Board, created under the Act, neither advocates nor discourages metrication. Rather, its responsibility is to devise and carry out a broad program of planning, coordination, and public education, consistent with other national policy and interests, to help organizations that do choose to convert to metrics. The Board's 17 members were nominated by the President and confirmed by the Senate in 1978. During the three years after it became operational, the Board conducted an active program in support of its Congressional mandate. In 1982, however, the Board phased out its activities because of Federal budgetary restrictions.

What Is Metric?

In most countries of the world, the metric system — in the form of the International System (SI: Système International d'Unitès) — is becoming the standard. Developed in France at the time of the French Revolution, the metric system was based primarily on the meter, a length defined as a small fraction of the earth's circumference. Since then the system has been refined and updated in many ways. Currently, it uses seven basic units:

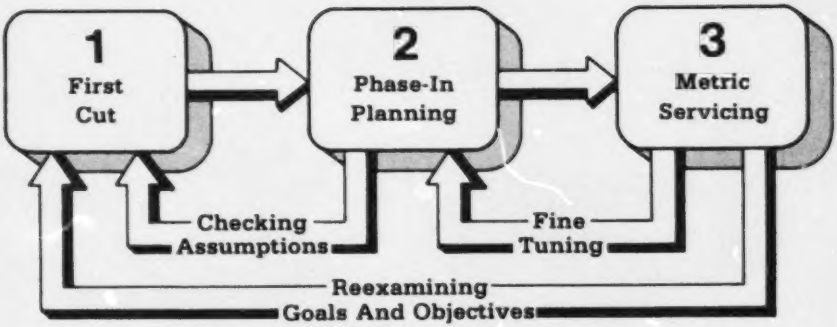
Length:	**Meter**
Mass:	**Kilogram**
Time:	**Second**
Electric Current:	**Ampere**
Temperature:	**Degree Kelvin**[2]
Luminous Intensity:	**Candela**
Amount Of Substance:	**Mole**[3]

Standard prefixes, such as "centi-" (as in "centimeter" — 1/100 of a meter) are added to give names for quantities of a particular unit that differ by multiples of 10. Other examples are the "kilometer" (1,000 meters) and the "millimeter" (1/1000 of a meter).

Our customary system of units is related more closely to human experience and human anatomy, from which it was derived. The "foot" is roughly the length of a human foot; the "yard" is approximately the distance between an adult's nose and the fingertips at the end of an outstretched arm; and the "mile" is about 2,000 paces. The temperatures of 0° and 100° Fahrenheit are based roughly on the coldest and hottest temperatures common in northern Europe, where these units were first established.

The metric system has been used for more than a century as the measurement

[1] Commonly called "weight."
[2] Commonly translated into the degree **Celsius,** formerly called the degree **Centigrade.**
[3] Useful in chemistry where the number of molecules is more important than the mass.



The Metric Conversion Process

"language" of the sciences. Scientists are concerned with changes in states of matter more often than with human anatomy and human experience. In designing temperature scales, for example, they set 0° and 100° Celsius as the temperatures at which water freezes and boils.

An intrinsic advantage of the metric system is its decimal nature. This greatly simplifies converting, for example, larger to smaller measuring units.

More complete definitions of metric units and detailed information on conversions between metric and customary units are provided at the back of this booklet.

What Is Involved In Going Metric

Going metric involves much more than simply learning the metric system and servicing metric products. It includes such things as deciding when and how fast to phase-in metric servicing, training personnel, establishing policies on providing hand tools and test equipment, obtaining metric parts and other supplies, and informing customers about your metric servicing capabilities.

If you are considering going metric in the near future, it is wise to use a systematic approach to making and carrying out your decision. We suggest three major stages, which are described in greater detail in the sections that follow.

In the initial stage — called the FIRST CUT in this booklet — you do a quick, rather rough analysis to determine whether it is worth looking at the question in greater detail. If you decide that the situation looks favorable for going metric now, you then start your PHASE-IN PLANNING. In this stage, you refine the considerations used in making your first-cut decision and make specific decisions and plans on how you will go about moving into metric servicing. This leads to the third stage actual METRIC SERVICING, in which you begin to carry out your plans and start servicing a significant number of metric products.

As you gain experience, you can start checking the results against your plans, "fine tuning" your plans, checking your assumptions, and even taking another look at your goals and objectives in going metric. You may find opportunities for metric servicing in new product areas, or possibly good reasons for slowing down the phase-in of metric servicing to accommodate only the amount of work you feel you need to keep your business healthy.

The First Cut

Like it or not, there is a continuing trend in the U. S. of increased sales of foreign and domestic metric products. Decisions by major U. S. manufacturers to convert to the metric system are having a major impact on their suppliers and on the companies that service their products throughout the U. S. If the suppliers are to retain their business from such manufacturers, they must provide metric products; if the product service companies are to continue to be responsive to customer needs, they must develop the capacity to handle metric as well as customary product servicing.

The degree to which manufacturers are converting to metric products varies among industries. Thus, the urgency of going metric at the product service level also varies, depending on the industry whose products are being serviced. For example, the four major U. S. automobile manufacturers made the decision to convert to metric during the 1970s. As of 1981, 90 percent of the components of General Motors cars were metric. So, if you are associated with a new car dealer, dual capability for both metric and customary product servicing has already become a necessity.

The type of metric product to be serviced also affects the impact on product service companies. In product areas such as electrical appliances, the electrical components already are specified in metric terms; thus, appliance service personnel will need to be more involved in metrics—such as buying metric tools and metric spare parts inventories—only if cabinets and fasteners are changed from customary to metric dimensions. In product areas of a more mechanical nature, such as plumbing fixtures or furnaces, any movement toward metrics is likely to have a much greater effect on product service companies.

Thus, both industry trends and product types are important considerations in a product service company's decision to develop a significant metric capability.

The questions that need to be addressed by a product servicing company that is considering going metric are:

- When should you start developing a metric capability?
- How fast should you phase-in your metric capability?
- What is involved in moving in that direction?

Owners and managers of product service companies usually can decide within just a few hours whether it is time to think seriously about going metric and how quickly they need to develop their metric capability. This is what we mean by taking a "first cut." Although the time to make your decision may stretch out to a few days if you feel you need to get more information on what is going on in your particular product area or in related service areas, the important thing to remember at this stage is not to get bogged down in details. In all the steps talked about here, rough estimates are good enough; there will be

plenty of time to refine your figures later if you do decide the time has come to go metric.

The reason for taking a first cut is that, more often than not, product service companies find that the arguments either for or against going metric are quite powerful. Thus, you may be able to make a decision rather easily at this stage without getting into a lot of detailed planning. In any case, however, it is a good idea to analyze the situation systematically—even if you do so quickly—rather than making a snap judgment. The next few paragraphs suggest how you might do this.

Among the first things to consider is what you expect to achieve—your overall goals and objectives—if you do go metric. Are you simply trying to keep your share of an existing market that is changing to metric? Or, are you interested in expanding your service capabilities to include servicing of new metric products? Are you simply interested in keeping your present customers' business, or finding new customers and broadening your areas of specialization? These questions are part of doing a preliminary . . .

Market Analysis

The whole point of doing a market analysis is to satisfy yourself that there currently is or there soon will be a large enough market to justify the investment of time and money that going metric may cost. A place to start this analysis is to take a hard look at the trends in metric product sales of both domestic and foreign manufacturers of the products you are now servicing. The sooner you know about such trends, the more time you will have to consider their impact on you and to plan for what you want to do about the direction of your own business.

The manufacturers of the primary products you now service are, of course, excellent sources of information on their own metric plans and trends in their industries. Many manufacturers that are shifting a portion of their operations to metric will be quite willing to discuss their metrication program with you and may be willing to help you in developing your own metric servicing capability. General Motors, for example, has a full-time corporate metric planning staff responsible for preparing and maintaining the corporation's metric manual, participating in metric planning and policymaking, working with divisions on problems, and providing external liaison. GM has, in fact, developed a metric training package which is now being used by automotive suppliers as well as other firms associated with GM products.

Your suppliers are another source of information on the degree of metric conversion in your area. If they are beginning to offer a significant portion of their product lines in metric dimensions, it may be worth discussing what their experience has been and how well they have been able to satisfy the demand for metric supplies. Their metrication experience may be a signal of an imminent transition throughout your industry.

For another indication of where your industry is going, look at your competitors. Are their advertisements, catalogs, or other sales literature featuring their capabilities to service metric products? If you belong to a trade association or union, it can be

First-Cut Check List

I. Market Analysis

- ☐ Define goals and objectives
- ☐ Check metric products sales trends (foreign and domestic)
- ☐ Check suppliers' trends
- ☐ Check competitors and trade associations for trends
- ☐ Identify types of product conversions and their impacts on servicing work
- ☐ Project customary versus metric new business

II. Cost Analysis

- ☐ Adding, replacing, or modifying tools and service equipment
- ☐ Adding, replacing, or modifying inspection and test equipment
- ☐ Training employees in metric
- ☐ Maintaining, storing, and handling dual inventories
- ☐ Revising service order forms and other documents
- ☐ Project total costs for developing metric servicing capability

III. Preliminary Metric Phase-In Decision

- ☐ Review projected sales revenues versus projected total costs
- ☐ Consider alternative phase-in plans for cost reductions
- ☐ Evaluate non-cost considerations
- ☐ Make preliminary decision

another source for information on what is happening in your industry.

In considering your metric market, you should be aware of the various types of metric products you will be servicing. Although some types of metric products can be serviced with your customary tools and test equipment, some modification or replacements may be necessary for servicing others. There are three basic types of metric products:

- **Hard Metric Products** — Products that are produced to metric dimensions or packaged in containers sized in metric units, and are labeled in metric units
- **Soft Metric Products** — Products that are still produced to customary dimensions or packaged in containers of customary sizes, but are labeled in metric units or, more commonly, in both metric and customary units
- **Hybrid Metric Products** — Products comprised of both metric and nonmetric parts or components

From the market analysis we have just described, you should have a good idea as to the types and volume of metric service business you can expect in the near and longer-term future. You also should be able to project roughly the proportion of customary to metric business you can expect and how it will change in the future. The way in which this proportion of metric to customary business varies will be a key element in making your first-cut decision.

There are, of course, some costs involved in developing a metric servicing capability. These should be estimated in your first cut . . .

Cost Analysis

In this part of the first-cut analysis, you can make rough estimates of the costs of developing a metric capability and can determine whether there will be any significant non-cost disadvantages in going metric. Many product service companies that have developed a metric capability report that their metrication costs have been almost insignificant, but you should not assume that this will apply to your own case until you have thought through your situation carefully. Some of the items to consider are the costs of:

- Adding, replacing, or modifying tools and service equipment
- Adding, replacing, or modifying inspection and test equipment
- Training employees in the metric system
- Maintaining, storing, and handling dual inventories
- Revising service order forms and other documents

Here again, as with the marketing analysis, precise figures are not necessary for this first-cut. Although it would be helpful to have the most accurate information available, you should not spend a great deal of time and effort in developing detailed cost estimates.

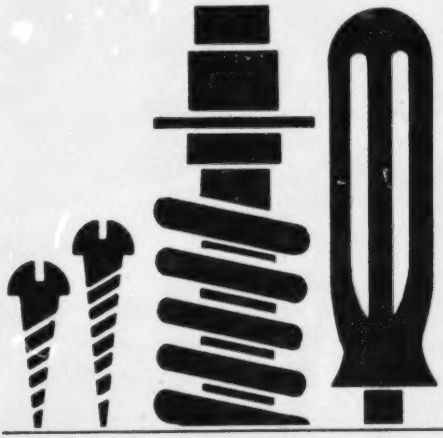
The timing of your metric phase-in program — both the starting time and the duration of the transition period — can have a significant impact on costs. If you

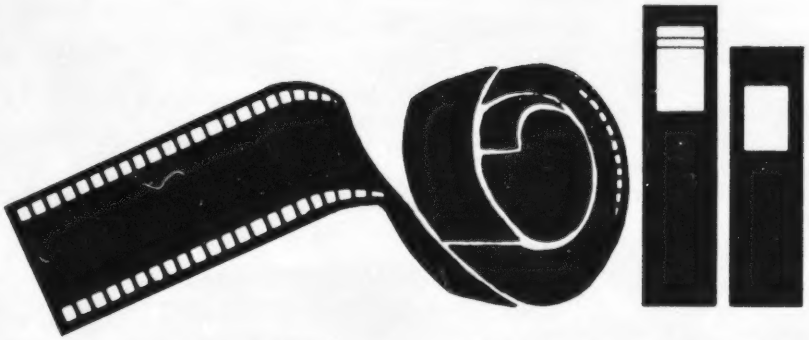
can phase-in the development of your metric capability gradually, it may be possible to modify or replace tools and equipment only when they would be replaced normally. Similarly, it may be possible to avoid obsoleting inventories of costly parts sized in customary units by scheduling a gradual conversion to metric servicing.

Most product service companies have found that major service, inspection, and test equipment investments are not required to handle metric work. It is seldom necessary to replace or even greatly modify customary equipment to service metric products. With dual labeling and conversion charts, workers have been able to service metric products with little, if any, special training. For example, in the case of automotive servicing, where pressures in kilopascals and torque in newtonmeters must be measured, modifications can be made to existing customary equipment and tools by affixing metric dials or indicators. When the time comes to purchase new replacement equipment, it is often possible to obtain it with both customary and metric readouts at little or no additional cost.

Some metric servicing will, of course, involve additional costs for obtaining metric hand tools. In some industries, tools are provided to employees by the employer, so the cost of metric tools must be added to the employer's cost of phasing in a metric capability. In other industries, employees provide their own tools. In these cases, it is necessary to consider whether requiring employees to buy new metric tools will create a labor relations problem. If so, can this be offset by giving the employees a one-time tool allowance? Or, can special arrangements be made with a supplier for providing the tools at favorable prices to your employees? Some employers buy a few sets of necessary tools and place them in the parts department to be checked out on an "as needed" basis.

The costs of metric hand tools can be kept down in other ways, too. For example, bolt head sizes—and corresponding sockets—are expressed in millimeters, but socket drivers are based on inch measurements throughout the world; that is, the drive end of a socket wrench is always made for a U.S. customary 1/4-inch, 3/8-inch, or 1/2-inch drive. Thus, the service mechanic or owner needs only to add new metric sockets to his tool box, and the handles and ratchets he already owns will fit both metric and inch sockets.





Training employees in the metric system is rarely a difficult or time-consuming process. Costs for training can be reduced by training only those who need to know, in what they need to know, and immediately before they need to know it. Service technicians will obviously need training, not as obvious is the importance of training employees in the parts department so they will know the appropriate bolt, fastener, or other part to supply to the technician. Consumer education for service business customers is not a factor in most cases. (This is not the case for retail trade customers, where educating consumers to understand and accept metric units has been a critical success factor.)

An important question in estimating training costs is whether you will be able to use on-the-job training or will need outside resources. In many product areas, manufacturers sponsor specialized one-day courses that are available free to your service technicians. In addition to your direct costs for sending employees to such courses, however, you should be aware of the potential loss of service revenue while the technician is away from the shop. Many product service companies have found that through routine on-the-job training they have been able to phase-in metric servicing with very little difficulty.

As more metric parts are used in various products that you are servicing, there may be a growing need to maintain dual inventories. In the automotive industry, for example, vehicles with parts sized in customary dimensions will continue to be on the road for many years, and they will require servicing. Consequently, automatic service shops need inventories of both metric and customary parts for several years to come. Similar conditions can be found in other industries. If yours is one of them, you will need to estimate how much your inventories are likely to increase and what the additional costs will be for dual storage space, identification, and handling of both metric and customary parts.

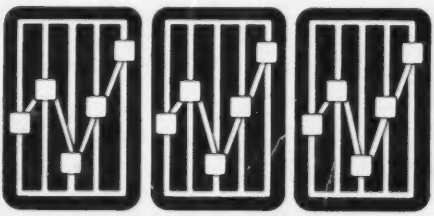
First-cut estimates of costs for revising your service order form and other administrative and accounting forms should be relatively easy. The largest cost in this area may be for printing the new forms. Even here, it often is possible to "make shift" with old forms until the forms inventory is exhausted.

When you are reasonably sure that you have considered all of the areas in which you are likely to incur significant new costs, combine these costs to arrive at your first-cut estimate of the total projected cost for developing a metric servicing capability. These costs together with your projected service revenues are what you will need to make...

The Preliminary Metric Phase-In Decision

In most cases, a simple review of the results of your projected sales revenues and projected total costs (including costs for acquiring a metric capability) over the next few years is all you need to make your first-cut decision on when and how fast you should move toward phasing-in metric servicing. At this stage of the analysis, your decision need not pinpoint a specific start date; you can, however, decide whether you need to start detailed phase-in planning now, or whether you can wait for six months to a year before starting to go metric.

The primary factor in making your decision about pacing will be the projected sales revenues for both metric and customary business. These so-called "demand curves" will give you a pretty good indication of how long there will continue to be a need for servicing and maintaining parts for customary products and how fast the new metric product service business can be expected to grow.



Your estimated costs for acquiring a metric capability can be scheduled to meet the demand curve requirements under various alternative plans. Depending on your rough estimates of metrication costs, you may choose to match the demand curve, delay some of the investment costs, or accelerate expenditures to acquire your metric capability. Your decision may depend on your reserves of investment capital the cost of financing, and non-cost factors such as availability of space or technicians.

Regardless of the criteria you use, the information you have generated during this first-cut analysis will put you in a good position to make a decision either to drop the idea of moving into metric servicing, at least for now, or to take a much closer and more careful look at metric servicing.

If you conclude that the expected demand for metric servicing will not be strong in the near future or that other considerations of particular importance to you are predominately negative, this is the time to make your decision against going metric. It makes no sense to spend more time and money on detailed planning or, of course, for employee training or other metrication actions. If you do decide against metrication at this time, however, it is wise to continue to keep an eye on trends in your industry. Conditions may become more favorable in the future, and it is better to recognize a change in the situation too early rather than too late.

If, on the other hand, results of your analysis are positive, it is time to proceed to the detailed planning necessary to start to phase-in metric servicing. While you are doing this, you will be defining the estimates and projections you made for the first-cut. If any of them change substantially, the decision to go ahead can be reexamined at any point.

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Phase-In Planning

To get started on planning your metric product service phase-in, most product service companies find that things go more smoothly if one person is assigned responsibility for coordinating the phase-in program. As a small business owner, you may decide to do this coordination yourself, or you may assign it to another senior member of the company. You might find it useful to set up a working group in addition to the coordinator if your metrication program is rather complex.

The metric phase-in planning process usually focuses on four major areas — demand forecasting, servicing planning, personnel training, and paperwork changes. The check list shown on page 17 may be helpful to you in planning your phase-in program.

Demand Forecasting

To begin the preparation of a phase-in plan, you can use the results of the first-cut marketing analysis to prepare your demand forecasts. These demand forecasts identify what kind of metric product servicing you expect to be doing and when you expect that work to come in. It is useful to consider both the short-term future, typically a year, and the long-term future, often covering the next five years. At this stage, the short-term forecasts should be developed in considerable detail, with as much accuracy as you can achieve. The long-term forecast is more general, often indicating only projected growth rates by product.

These forecasts should provide service demand information on two types of products: existing products (i.e., products that make up current product service business) and potential new metric products (i.e., metric products that you do not now service but could if you had a metric service capability).

Concentrating first on the short-term demand forecast will provide the information you need to plan for phasing-in your metric servicing capability. A good way to start this forecast is to review your own service sales records for the past six to 12 months. Labor charges on these records probably will not differentiate one type of work from the other, but the parts charges may identify metric and customary materials used. These parts charges can be plotted on a graph to show trends in demand for metric and customary parts. This information can also be used to develop a rather detailed forecast of parts (both metric and customary) and labor that you will need to provide for the next year, on a month-by-month basis.

In addition to your own experience for the past year, you will want to review carefully the information obtained during the first-cut analysis on what the manufacturer of the primary product you are presently servicing is planning with respect to metric conversion. Similarly, the information on metric plans of your present suppliers and competitors should be reviewed. All of this information can help in preparing your short-term demand forecast for servicing metric products.

In preparing a long-term demand forecast, you should consider the potential for service business on metric products other than those you are currently servicing. By going metric, you may be in a position to take on a new product line of metric service business and increase the total volume of your sales over the coming years. It may be useful to designate an individual, or you may wish to take the responsibility yourself, for new metric products service marketing so that new sales possibilities will not be overlooked.

Although you may not have been involved previously in service business for the U.S. Government, metric servicing capability does open up the possibility of an expanded market for you. Most Federal agencies have agreed to accommodate businesses that move to metric if the product or service still is compatible with the Government's need. Agencies are also generally willing to answer questions from you about plans they may be considering to change their buying or service requirements to metric. There are, of course, many factors to consider before deciding to enter this field. One source of marketing information is the "Commerce Business Daily," which lists U.S. Government procurement invitations to bid, contract and subcontract awards, sales of surplus property, and foreign business opportunities. If you would like to learn more about this area, you can find helpful information in some of the publications listed at the end of this booklet.

You will want to notify current customers, and prospective new customers as well, of the availability of your new metric service capability. This will require planning and scheduling of advertising, sales literature, catalogs, letters, or other marketing materials. Any pricing changes resulting from the new servicing capability also will need to be posted.

Service Planning

Once the demand forecasts are well along, you can begin planning the changes you will need to make in your servicing operations. Using the short-term demand forecast, the service order manager, parts manager, and shop manager[4] can begin to plan changes needed in their respective areas of responsibility. In some cases it may be enough to alert the service technicians to separate metric parts carefully from customary parts and to use the proper metric tools and equipment. This may involve a service order form change to allow this information to be entered.

The shop manager will need to make sure that the proper hand tools and service equipment are available to meet the scheduled demand for specific metric product servicing. Similarly, purchase and installation of special inspection and test equipment may be required. As indicated in the first-cut analysis, a management policy will be required on how metric tools will be obtained (i.e., by management or by the employees). Based on a detailed review of the expected product changes, the specific modifications to existing service, inspection, and test equipment—such as

[4] We recognize that many small businesses will not have separate people in each of these positions. We are referring here to the person who performs these functions—possibly even the owner himself.

Phase-In Planning Check List

I. Demand Forecasting

- ☐ Trends in converting products now serviced to metric
- ☐ Potential new metric product service work
- ☐ Sales literature; catalogs
- ☐ Customer notification
- ☐ Continuing metric market research

II. Servicing Planning

- ☐ Tools and service equipment
- ☐ Inspection and test equipment
- ☐ Performance and testing specifications
- ☐ Metric supply sources
- ☐ Purchasing specifications
- ☐ Dual inventory facilities procedures
- ☐ Scheduling metric servicing phase-in (lead time requirements)

III. Personnel Training

- ☐ Employee notification
- ☐ Training needs identification
- ☐ Type of training determination
- ☐ Training materials availability (including shop charts)
- ☐ Scheduling training

IV. Paperwork Changes

- ☐ Service order forms
- ☐ Testing reports
- ☐ Parts/tools check-out forms
- ☐ Accounting records
- ☐ Scheduling procedural/printing changes

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label, dial, or meter readings—can be planned. Here, again, the manufacturer of the principal products you now service will be an excellent source for determining what you will need in special tooling and equipment, or modifications of customary equipment.

The parts manager will need to identify specific suppliers who have the necessary metric parts needed to handle the forecasted metric products service work. Some work will need to be started at this stage in contacting suppliers for both parts and special tooling in order to estimate the lead times for obtaining these items.

Facilities may need to be planned for storing dual inventories, and new procedures may need to be developed for determining inventory levels and for purchasing, handling, and distributing these parts. Using the demand forecast, the needed amount of floor or bin space for both metric and customary parts inventory can be determined. As noted earlier, you may need to maintain dual inventories for a considerable time.

Personnel Training Plans

Successful phase-in of metric servicing requires people who understand why the change is being made, who support the idea, and who are ready to do what is necessary to make it work. Thorough planning of personnel policies and training is the key, especially if you expect any resistance of labor relations problems as the metric phase-in takes place.

Making everyone aware of the program is the first step. You can do this by preparing an announcement briefly explaining why metrication is important to the future of your company and summarizing the primary steps involved. In addition, you can hold an orientation meeting in which you describe the program in greater detail, assign individual responsibilities, and talk about how each individual or group will be affected. Employees should be encouraged to talk freely about their fears or dislikes of the metric system, if they have any, so that these can be met head on. At this stage, detailed planning for the metric phase-in will still be in the early stages. This is a good time to start bringing more people into the planning process, not only because they can make a real contribution but also so they will feel some "ownership" of the new service capability.

Some basic orientation materials on the metric system can be used by all of your staff, but you may want to tailor some training programs for the specific needs of particular groups. The requirement for separate training will depend on how complicated your company operations and the products you service are.

Service technicians will require the most extensive training, of course, although some may have already acquired some competence in their prior jobs or an apprenticeship. The availability of dual labeling, conversion charts, and converting calculators can alleviate much of the anxiety that service employees may experience about metric work.

Customer service personnel typically will need only to be familiar with metric product sizes, performance, and other characteristics so they will be competent and comfortable in discussing problems

with customers. Administrative and accounting people will need only to know how to convert and compare some metric and customary units that may be used in billing and in routine management reports on status of work completion, costs, and sales.

At this stage, you will need to make the decision as to whether you will conduct training in-house or will use outside resources. In making this decision, you should consider how well metrics are understood by the people in your company who might do the in-house training, their ability to train others, and their availability to do the training in addition to their other duties.

If you decide to train with in-house resources, training courses must be planned, and training materials and teaching aids must be prepared or purchased. Specialized materials on the specific products you service can be obtained from the manufacturers. General metric training materials are available in a variety of forms such as printed booklets, worksheets, slides, films, and videotapes. They can be obtained from private industry, commercial training firms, technical or community colleges, high schools, unions, trade associations, and others.

When you have made all these decisions, your personnel plans can be put in final form, complete with a schedule of actions to be taken, who will be responsible for and affected by each action, when it will be started, and how long it will take.

Paperwork Changes

The final area to be considered in detailed phase-in planning is what changes will be needed in your paperwork. Necessary procedural changes will already have been identified by the various groups in the

company as they plan to modify their activities to accommodate the metric servicing phase-in. Now you will need to consider what paperwork changes will be needed to support these procedural changes.

This can start with a survey of your present work order and accounting forms to identify the ones requiring changes. Dual entries may be required on some forms for both customary and metric units. Reporting formats should be reviewed in the same way to determine whether they, too, need to be changed. After the specific changes have been identified, estimates must be obtained for the time and costs involved in printing and then in phasing-in the new forms.

Another significant task in this area is planning required for software program changes in any computerized information system you now use. Estimates will be needed of the time and cost of necessary reprogramming, and these changes must be scheduled to minimize disruption of on-going operations.

The Final Phase-In Decision

As you work through the areas described above — carrying each only to the degree of detail appropriate for your own particular situation — you will have completed a comprehensive, detailed metric servicing phase-in plan. As an important by-product, you will have refined your projections of metric service demand, developed more accurate estimates of the costs involved, and examined more closely some of the intangible advantages and disadvantages of phasing-in a metric service capability. If you discover that any of these considerations are less favorable than you thought during the first-cut, you may want to take another look at your decision to go ahead at this time.

Before you make a final decision to metricate, however, there are some additional cost factors to look at, and you may wish to complete a somewhat more detailed analysis of the probable financial impact on your company of going into metric servicing.

Two additional cost factors are of particular importance and should not be overlooked. First, consider whether you will need to borrow money to cover the costs of acquiring a metric capability. If so, how much, and for how long? In answering these questions, it is useful to develop a "cash-flow" analysis, using the figures you developed earlier to project how the phase-in will affect the flow of cash into and out from your company. When you have determined your borrowing needs, if any, consider how much these loans will cost in the form of interest. This cost should be added to the costs you estimated earlier.

Second, you should consider the tax implications of your metric phase-in plan:

- Under the **accelerated cost recovery provisions** of current Federal income tax laws, qualifying machinery and

equipment you buy for the metric servicing can be depreciated over periods of three to five years.

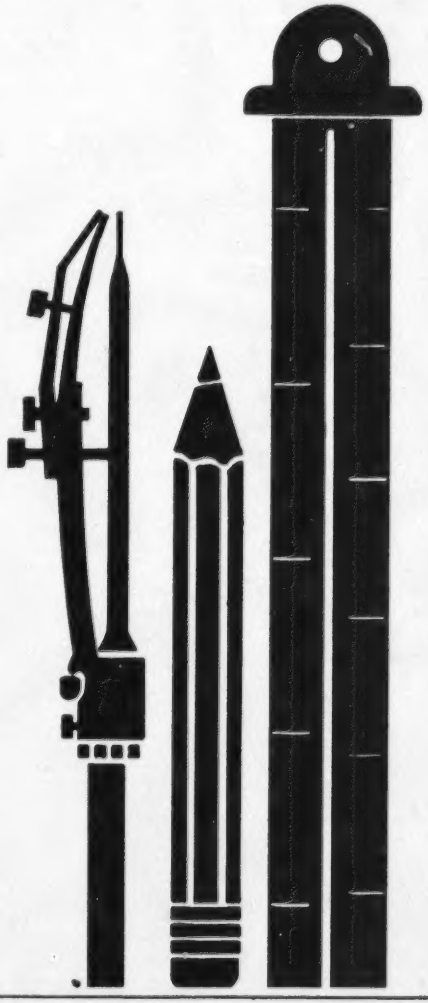
- **Investment credit** is available for companies that acquire qualifying new machinery, equipment, and tools.

These provisions relate, of course, to the Federal income taxes your company (or possibly your workers) pays. Similar credits may or may not be available under the State income tax laws to which your company is subject. If you qualify for any such credits, they must be used to reduce the costs of acquiring a metric capability you estimated earlier.

When you have determined whether any of these additional cost considerations apply, you are ready to finish your financial analysis. The first step in this analysis might be to forecast what your profit and loss statements and balance sheets (and possibly a return on investment analysis) will look like for the current and next year, as you phase-in your metric program. These forecasts are known as "pro forma" financial statements. There may be significant changes in these pro forma statements for alternative phase-in plans, so the timing and rate of change-over to metric is very important in preparing your phase-in plans.

If the arguments for or against moving into metric servicing at this time are quite compelling for your company, you may wish to stop the analysis at this point or proceed with the phase-in program. If you are in more of a borderline situation, however, you may want an even more detailed analysis. Some of the references listed at the end of this booklet may be of help, or you may want to ask for help from your accountant or other outside advisor.

If your final decision is still positive, you now are ready to go to the phase-in of metric servicing.



Metric Servicing

As you move into metric servicing, your primary attention will be focused on carrying out the actions you have planned up to this point.

A useful way to "kick-off" this stage is to convene a meeting, similar to the one held at the start of the phase-in planning stage. In this meeting, you can reconfirm your commitment to the metric servicing program. Employee motivation and support can be enhanced by reviewing the importance of the program to the future of the company and thus to the job security of each employee, and by explaining again what the change-over will mean in each employee's job activities. Depending on the size of your company, you may want to schedule one meeting for all employees or separate meetings for each of the groups affected.

To ensure that everyone gets the same message, it is helpful to use visual aids, such as posters or flip charts showing the overall phase-in plan and schedule. In addition to using them at the meeting, posting these visual aids and other metric information on bulletin boards in various areas of the building encourages employees to start thinking in metric terms.

In accordance with your plans, you probably will find it most effective to designate an individual in each major activity — usually the manager — as the task leader for his or her activity. These task leaders should carefully study the plans as they affect their activity. They should make sure that these plans are followed closely, unless specific changes are approved by all the task leaders collectively.

As your company begins to change operationally to metrics, it is critically important that you keep a continuous check on how closely the actions are tracking your plans. Many companies find that this can be done most effectively by having frequent meetings (most often weekly) of the task leaders to review the prior week's experience.

These meetings will be most effective if a set of special reports is generated for the use of the task leaders. The contents of these reports should be tied closely to your phase-in plans and therefore will vary somewhat from company to company. In general, however, you may find it useful to generate a set of reports covering specific operational areas.

In the **demand forecasting** area, data would be useful on weekly sales statistics for both metric and non-metric product servicing, possibly including these statistics:

- Sales in number of products serviced and dollars
- Sales by customer, with a separate tabulation of sales to new customers
- Sales by existing metric products and new metric products serviced

In the **metric servicing** area, data could be collected on:

- Units serviced per hour or day

- Units rejected at first inspection and reworked
- Scrap volume by quantities and dollars
- Percentage of products serviced on time, as promised
- Actual versus planned inventory levels and dollar values

In the **personnel training** area, information on the number of employees who have completed metric training and turnover rates might be of interest.

In the **paperwork** area, data could be collected on progress in changing procedures, forms, and computer programs versus the planned schedule of these changes.

When you review these progress reports with your task leaders at a regularly scheduled meeting, the result typically will be improved communications among everyone involved and a reduction in potential conflicts, errors, and misunderstandings. The need for face-to-face review meetings cannot be overstressed; without such meetings, progress reports too often receive only a cursory review. Through discussion and exchange of ideas at progress review meetings, the need for corrective action can be recognized at the earliest possible time, and the decision to take such action can be made and communicated to all affected task leaders.

Each time the review uncovers a discrepancy between what you expected to happen and what has actually happened, you should investigate the situation to determine whether the discrepancy was caused by a flaw in your phase-in plans or by someone not following those plans closely enough. If the latter, you may need to take corrective action before the situation gets even further off track. If the problem is with your plans, however, this is a signal that you should go back to the phase-in planning stage to "fine tune" those plans to fit reality more closely.

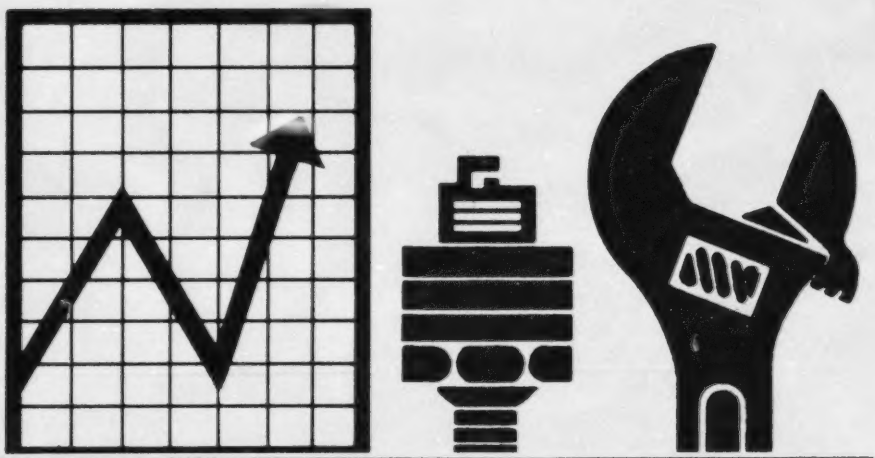
In addition to fine tuning of phase-in plans and implementation activities, most companies find it useful to carry out a broader scale evaluation of their metric servicing experience at intervals of six months to a year after the phase-in program is initiated. The primary focus of this evaluation usually is on reexamination of the original metrication goals and objectives. Although you may have completed the phase-in according to your work plan, taking a second look after six months or a year may reveal that your work plan may have overlooked some internal capabilities or limitations that have turned out to be particularly important in this situation.

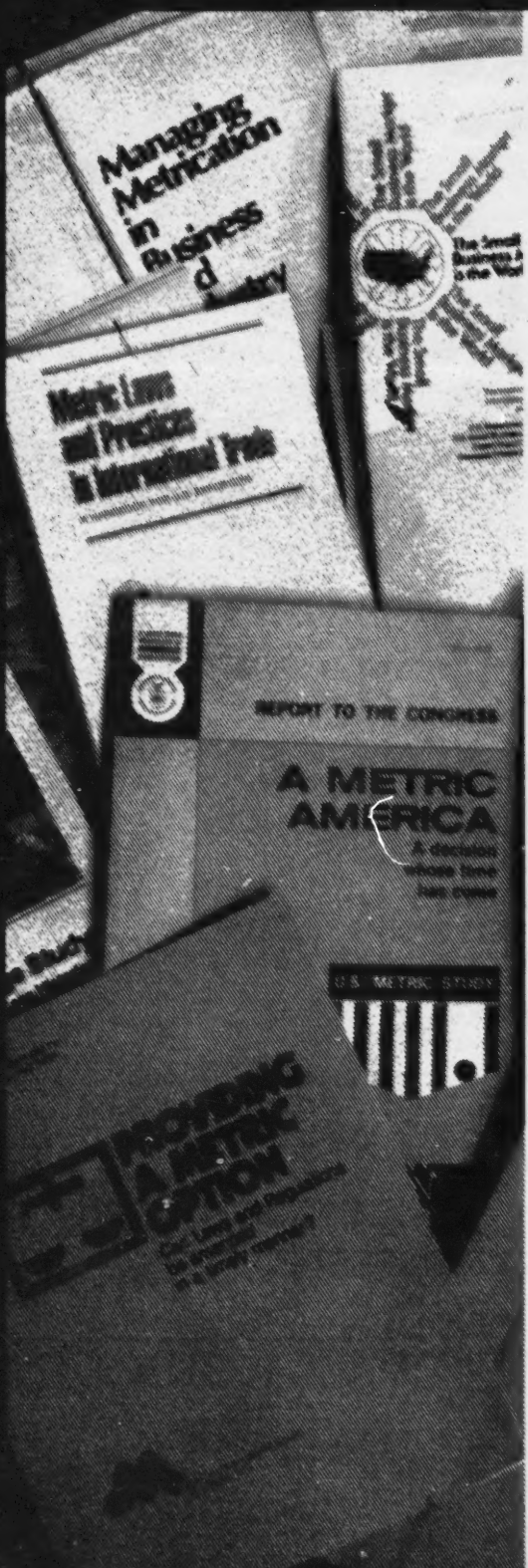
Also, external conditions may have changed to such an extent that your original goals and objectives may no longer be appropriate. For example, market demand for metric product servicing may have changed downward.

On the other hand, your experience with metrics may have convinced you that the market potential is even better than expected, and the metric phase-in process easier and less expensive; this might convince you that your metric service plans should be expanded significantly.

In this latter case, the evaluation lays the groundwork for repeating the entire process described in this booklet. Following the same pattern used in the first move toward metrics, the attractiveness of servicing new metric products or new markets for existing metric product servicing is examined in a first-cut; if the results of the first-cut are favorable, phase-in planning is initiated; this leads to actual metric servicing, then to periodic "fine tuning" and reevaluation.

By repeating this cycle periodically, your company can be relatively confident that it has taken full advantage of its market opportunities with respect to metric product servicing, and at the same time has avoided embarking on acquiring a metric servicing capability with insufficient profit potential.




Managing Metrication in Business and Industry
Metric Laws and Practices in International Trade
REPORT TO THE CONGRESS
A METRIC AMERICA
U.S. METRIC STUDY
Deciding A METRIC OPTION

List of Other Sources

Organizational Sources

American National Metric Council
5410 Grosvenor Lane
Bethesda, Maryland 20814

American National Standards Institute
1430 Broadway
New York, New York 10018

American Society for Testing and Materials
1916 Race Street
Philadelphia, Pennsylvania 19103

Federal Interagency Committee on Metric Policy
Mr. Howard B. Ellsworth
Chairman, Metrication Operating Committee
OUSD (R&E) SS, Department of Defense
Room 2A318, The Pentagon
Washington, D.C. 20310

Metric Commission Canada
320 Queen Street
Ottawa K1A OH5 Canada

Office of Productivity, Technology, and Innovation
U.S. Department of Commerce - Room 48-72
14th & Constitution Avenue, N.W.
Washington, D.C. 20230

Small Business Administration
1441 L Street, N.W.
Washington, D.C. 20416

South African Bureau of Standards
Private Bag X191
Pretoria, South Africa

Superintendent of Documents
U.S. Printing Office
Washington, D.C. 20402

Technical Help to Exporters (THE) Program
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161

U.S. Metric Association
10245 Andasol Avenue
Northridge, California 91325

Or, by writing your State Department of Commerce to determine if there is a Metric Board within your State.

Published Sources

I. Training Materials

Crouse, William H. and Anglin, Donald L. **"The Impact of Metrication on Automotive Education,"** Technical Education News. Gregg/Community College Division, McGraw-Hill Book Company Volume/No. 2. March/April 1975.

Middlesex Research Center, Inc. **Effects of Metric Change on Workers' Tools and Training.** Washington, D.C.: Middlesex Research Center, Inc., (3413-1/2 M Street, N.W., Washington, D.C. 20007), July 1981.

Presents the findings of a study conducted with the purpose of gaining an understanding of the effects of metric change in four areas.

Boselovic, Len, ed. **SI Metric Training Guide.** Washington, D.C.: American National Metric Council, 1979.

Additional sources of training materials are available through the American National Metric Council and the sub-committees of the Council by writing: American National Metric Council, 5410 Grosvenor Lane, Bethesda, Maryland 20814.

Those interested in obtaining training materials can also write to the United States Metric Association, 10245 Andasol Avenue, Northridge, California 91325 or can contact their State's Teachers Association — in particular, the Math Teachers' Associations.

Or by obtaining the most recent copy of your manufacturer's service manual as many of these manuals contain a chapter dedicated to servicing metric products.

II. Cost Analysis

Goulet, Peter G. **Attacking Business Decision Problems With Breakeven Analysis.** Washington, D.C.: U.S. Small Business Administration, April 1980.

Illustrates ways in which breakeven analysis can be applied to sales, profit, cost, and selling price problems and how it can be used to help make sound decisions for employing idle plant capacity, planning advertising, granting credit, and expanding production.

III. Marketing Analysis

United States Small Business Administration. **Marketing Research Procedures.** Washington, D.C.: U.S. Government Printing Office, 1980.

Emphasizes the six steps of marketing research procedures — the means by which information about the various elements that make up buying and selling is obtained and evaluated. In addition, contains a bibliography of U.S. Government and nongovernment publications for those who plan to do their own marketing research, those who need to evaluate market research being performed for their firms, and those who wish to learn more about the techniques of research being used in various marketing areas.

IV. Metrication — General Issues For Small Businesses

Foote, Mary and Annan, Sampson O. **Survey of Small Businesses: Issues in Metric Planning and Conversion.** Rockville, Maryland: DAMANS and Associates, Inc. (1370 Piccard Drive, Rockville, Maryland), December 1980.

Primary purpose of this study was to determine the scope and nature of the benefits, problems, and issues confronting small businesses in their voluntary conversion to the metric system.

Hitchcock, Henry H. and Coates, J.F. **The Search for Small Businesses with Investments In Metric Production.** Washington, D.C.: J.F. Coates, Inc. (3738 Kanawha Street, N.W., Washington, D.C. 20014), June 1981.

Study of a variety of suppliers and customers with a concentration on small businesses that have made substantial investments in converting to metric. Focuses on the costs, benefits, expectations, problems, opportunities, and outcomes of conversion. Reports on where the nation stands as a result of past and current policies.

Landvater, John. **What About the Little Guy?** Metric Bulletin, April 1977.

Presents the key to cost-efficient metrication as the development of simple realistic plans, including policies and benchmarks.

Metric Commission Canada. **A Metric Handbook for Small Businesses.** Ottawa, Canada, 1979.

Designed as a guide to assist businesses with plans to convert to the metric system. Provides employees with appropriate and timely information and training during the transition period and helps avoid unnecessary costs during the conversion process.

Metrication Board. **Going Metric In The Small Firm—A Practical Guide for Management.** London, England, 1975.

Provides a ten-point checklist for planning an efficient and economic metric change. Provides suggestions for planning a changeover so that the period of dual stocking is shortened.

Motley, John G. III. **Metrication: Problems and Opportunities—Small Business and Metric Conversion.** Washington, D.C.: American National Metric Council, 1974.

Examines the role of U.S. small business in the metric conversion process and determines the attitude of the American small business community toward metric conversion and the potential impact of conversion.

U.S. Metric Board. **Metric Issues for Small Business—Executive Summary.** Arlington, Virginia, August 1981.

Presents the findings of a survey conducted by the U.S. Metric Board of five categories of firms—construction, manufacturing, retail trade, transportation, and wholesale trade. This study is part of a continuing effort of the Metric Board to report on the status of the use of metric measurements and identify the benefits from the problems with converting from customary to metric units.

V. Metrication—General Issues

American National Metric Council. **Managing Metrication In Business and Industry.** New York: Marcel Dekker, Inc., 1976.

Written for managers of all kinds of operations to assist organizations in meeting the planning and management challenges of metric conversion. Presents a case-study approach to metrication management, illustrating the common questions and problems.

Applied Concepts Corporation. **A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation—Comprehensive Report on the Conversion Process** (Task 1). Reston, Virginia: Applied Concepts Corporation (P.O. Box 2760, Reston, Virginia 22090), August 1981.

Assesses USMB's planning guidelines in the light of lessons learned in a conversion that has recently occurred—the conversion of containers for distilled spirits beverages. Establishes the historical baseline regarding events that occurred, the reasons for these events, their impacts, and the lessons learned in this conversion that may be meaningful for other industries.

Applied Concepts Corporation. **A Study of Metric Conversion of Distilled Spirits Containers: A Policy and Planning Evaluation—Final Report on Findings and Lessons Learned.** Reston, Virginia: Applied Concepts Corporation, (P.O. Box 2760, Reston, Virginia 22090), October 1981.

Summarizes the results of the entire study of metric conversion of distilled spirits containers, which entailed conducting a detailed case study of the distilled spirits conversion; developing and analyzing a set of hypothetical scenarios regarding the circumstances of the conver-

sion and USMB's possible role in it, assessing the completeness and clarity of USMB's planning guidelines; conducting a survey of consumer awareness of and attitudes toward the conversion, and analyzing the implications of the findings from all of the above for USMB policy.

Applied Concepts Corporation. **Survey of Consumer Attitudes And Awareness of the Metric Conversion of Distilled Spirits Containers.** Reston, Virginia: Applied Concepts Corporation, (P.O. Box 2760, Reston, Virginia 22090), December 1981.

Examines a completed private sector conversion to the metric system, in the light of the U.S. Metric Board's planning guidelines and procedures. Also contains the results of a consumer survey that assesses current attitudes, awareness, and behavior as they relate to information needs of the customer in making marketplace purchase decisions.

Benedict, John T. **Metrication For The Manager,** Washington, D.C.: American National Metric Council, 1977.

Serves as a prime reference source for metrication management. Fills middle management's need for condensed, authoritative information about the metrication process.

Cooper, Edith Fairman. **Social and Economic Implications of U.S. Conversion To The Metric System of Weights and Measures: Spectrum of Current Opinions.** Washington, D.C.: Congressional Research Service, February, 1979.

Presents a compilation of differing opinions concerning the social and economic implications of the Nation's conversion to the metric system of weights and measures.

Discusses the International System of Units (Système International),the version of the modernized metric system that is the internationally agreed upon practical system of units of measurements. In addition, it presents a survey of what SI is, how it came about, and how it is likely to develop in the future.

Interagency Committee on Metric Policy. **Federal Metric Information Referral Directory.** Washington, D.C., December 1981.

Lists Federal agency personnel knowledgeable about the status within preeminent areas of Federal responsibility.

International Brotherhood of Electrical Workers. **Realities of Metrication—A Report.** Washington, D.C., 1977.

Traces the history of labor's involvement with metrication and examines the major arguments for conversion, the impact of conversion in the U.S. and the role of labor and the Federal Government.

King, Lisa L. **U.S. Metric Board 1979 Survey of Selected Large U.S. Firms and Industries—Final Report.** King Research, Inc., (6000 Executive Boulevard, Rockville, Maryland 20852) May 1980.

Reports on the status and projections of metrication among large U.S. firms and industries and provides both government and industry with information regarding voluntary conversion to the metric system.

Middlesex Research Center, Inc. **Effects on Safety in the Workplace for Selected Occupations.** Washington, D.C.: Middlesex Research Center, Inc. (3413-1/2 M Street, N.W., Washington, D.C. 20007) April 1982.

Addresses the need for a detailed analysis of safety issues related to metric conversion. Identifies those occupational tasks that, when subjected to measurement change, would most likely create worker safety hazards and public safety hazards.

National Bureau of Standards. **A Metric America: A Decision Whose Time Has Come.** Washington, D.C.: U.S. Department of Commerce, 1971.

Evaluates the impact of increasing worldwide use of the metric system on the United States and considered alternatives for national policy. Twelve supporting volumes provide additional detail.

United States General Accounting Office. **Getting A Better Understanding of the Metric System—Implications If Adopted by the United States—Executive Summary.** Washington, DC. October 1978.

Analyzes the still unresolved question of whether the Nation's measurement system

should be changed. Provides the Congress, the Administration, the U.S. Metric Board, and all Americans with a better understanding of the issues involved.

United States General Accounting Office. **Getting A Better Understanding of the Metric System—Implications If Adopted By the United States.** Washington, D.C., October 1978.

Discusses the implications if the U.S. converts to the metric system of weights and measures in addition to discussing the conversion experiences of other countries. Presents the results of 1,400 questionnaires mailed to small businesses, the 500 largest industrial corporations, all State governments, and State educational agencies, 400 associations in the building and construction industry; discusses consumer views; reviews relevant legislation and available documents on metrication; and includes discussions with officials of Canada's metric commission, the United Kingdom's metrication board, and with several British and Canadian industry representatives.

United States Metric Board. **Five Years After the Metric Conversion Act Where Do We Stand? Survey of Large U.S. Manufacturing and Mining Firms (the Fortune Magazine 1000) Executive Summary.** Arlington, Virginia, December 1980.

Presents the results of this survey which addresses the number of companies producing metric products and providing metric services, the proportion of total sales (foreign and domestic) that are metric products, the extent of planning underway for the use of the metric system in industry, inhibitions affecting metrication, and expectations for the future.

U.S. Metric Board. **1979 Annual Report.** Washington, D.C., 1980.

Reports on the annual activities of the United States Metric Board. Includes a status report on the extent of metric usage and projections for future conversion activity.

U.S. Metric Board. **1980 Annual Report.** Washington, D.C. 1981.

Describes the actions taken by the U.S. Metric Board in support of the congressional instructions set forth in the Metric Conversion Act of 1975. In addition, provides a status report on the progress of increasing voluntary metric usage.

U.S. Metric Board. **U.S. Metric Board Research Overview and Analysis.** Arlington, Virginia, April 1982.

Presents the findings as well as the conclusion of the agency's research efforts and discusses recommendations for a national assessment of metrication.

U.S. Metric Board. **U.S. Metric Board Summary Report.** Arlington, Virginia, July 1982.

The agency's final summary report which presents its activities and accomplishments over the last five years and provides recommendations to Congress and the President.

Ehkin, Lawrence P.; Thorne, Betty J.; and Keaton, Paul N. **Metric Conversion: Where We Are and Where We're Going.** Society for Advancement of Management, Spring 1980.

Gassage, S.M., Chairman. **How To Launch Metric Conversion in Your Organization 1-Investigation Phase.** Ottawa, Canada: Metric Commission, 1979.

McArthur, D.R.B., Chairman. **How To Plan Metric Conversion.** Ottawa, Canada: Metric Commission, 1974.

VI. International Issues

U.S. Department of Commerce, International Trade Administration. **Metric Laws and Practices In International Trade—A Handbook for U.S. Exporters.** Washington, D.C. February 1982.

Provides basic information to American exporters on foreign laws and regulations pertaining to metric requirements for imported products.

U.S. Department of Commerce. U.S. Small Business Administration. **The Small Business Market is the World.** Washington, D.C.: Export-Import Bank of the U.S., Overseas Private Investment Corporation.

Conversion Tables

Approximate Conversions to Metric Measures

Customary Symbol	When You Know	Multiply by	To Find	Metric Symbol
		LENGTH		
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	metric ton	t
		VOLUME		
tsp	teaspoons	5	milliliters	mL
Tbsp	tablespoons	15	milliliters	mL
in^3	cubic inches	16	milliliters	mL
fl oz	fluid ounces	30	milliliters	mL
c	cups	0.24	liters	L
pt	pints	0.47	liters	L
qt	quarts	0.95	liters	L
gal	gallons	3.8	liters	L
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	degrees Fahrenheit	5/9 (after subtracting 32)	degrees Celsius	°C

Metric Measures to Approximate Conversions

Metric Symbol	When You Know	Multiply by	To Find	Customary Symbol
		LENGTH		
mm	milliliters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares ($10,000m^2$)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	metric ton (1000 kg)	1.1	short tons	
		VOLUME		
mL	milliliters	0.03	fluid ounces	fl oz
mL	milliliters	0.06	cubic inches	in^3
L	liters	2.1	pints	pt
L	liters	1.06	quarts	qt
L	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	degrees Celsius	9/5 (then add 32)	degrees Fahrenheit	°F

IMPORTANT NOTE

There is some confusion about the role of the U.S. Metric Board and the national policy on metric conversion.

Congress established the Board to plan and coordinate the voluntary increasing use of the metric system. It is not, however, the role of the Board to promote metric usage.

The Board is an independent Federal agency responsible for conducting public information and education programs and appropriate research, coordination and planning activities.

Metric Conversion in this country is voluntary. When Congress passed the Metric Conversion Act in 1975 it did not make conversion mandatory; nor did it establish a target date or deadline for conversion.

The Board has no compulsory power. It is a public service agency consisting of citizen representatives from all walks of American life. Its 17 members are appointed by the President and confirmed by the Senate. Members are nominated to represent labor, retailing, small business, industry, construction, state and local governments, science, engineering, consumer groups and the public at large.

Please contact us if you have any questions about the role of the Board or the national policy on metric conversion.

United States Metric Board
Suite 400
1600 Wilson Boulevard
Arlington, Virginia 22209

Credits:
Technical Direction: S. Parent, E. McEvoy
Text: C. Beek, L. Cohen, R. Steele
Graphic Design: T. Wright
Research: C. Beek, L. Cohen